

Original article

Cataract surgical rate in Yemen: 2012



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Abstract

Objective: To determine cataract surgical rate (CSR) in 2012 (01 January to 31 December 2012) in 22 Governorates of Yemen in order to identify the needs to reduce cataract related blindness.

Methods: A standardized questionnaire was sent to the 184 eye units in governmental, university, military, private and charity clinics and hospitals in Yemen.

Results: The response rate to the questionnaire was 80.7%, and the collected data are summarized. During the 12-month period, a total of 62,577 cataract surgeries were performed by 268 ophthalmology specialists and residents. The cataract surgical rate was 2473 cataract operations per million inhabitants per year. Intraocular lens implantation was performed on 98% of the cases.

Conclusion: CSR has increased in Yemen in the recent years but is still below the target suggested by WHO. There is need to increase the cataract surgical rate in Yemen mainly in rural areas. Inadequate number of eye surgeons, limited accessibility of cataract surgical services in rural areas and the affordability of surgery to large sections of society are major constraints that have to be addressed. The information from this study will help and enable Ministry of Health and other eye care providers to more equitably disperse trained ophthalmic personnel and eye units in Yemeni governorates.

Keywords: Cataract, Cataract surgical rate, Yemen

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Introduction

Republic of Yemen is located in the south west part of the Arab Peninsula with an area of 555,000 square kilometers. Yemen population is around 25.3 Million distributed in 21 governorates in addition to the capital city of Sana.¹ About 68.2% of the population lives in rural areas.²

Yemen is one of the WHO Eastern Mediterranean Region countries, the estimated prevalence of blindness in this region is 0.97^{3,4} and Yemen is regarded as one of the countries with high prevalence rate of blindness.^{5,6}

Cataract blindness is a public health problem of major proportions in developing countries. The major contributors to

blindness in Yemen are cataract (49–70%), glaucoma (11%), retinal diseases (9–10%), corneal diseases including microbial and traumatic corneal opacities (5–9%) and others.^{5,6}

Cataract-related blindness treatment is one of the priorities of WHO and the International Agency for the Prevention of Blindness especially after the presentation of the VISION 2020: the Right to Sight initiative in 1999. However, 75% of blindness is avoidable, defined as blindness that can be either treated or prevented by a cataract surgery which is a successful, cost-effective intervention.⁷ One of the VISION 2020 strategies is monitoring the cataract surgical rate (CSR) and evaluating its trend over time. The CSR is defined as the number of cataract surgeries per million population

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per year and it is an international recognized critical index of cataract surgery service activity and an indicator of the availability and accessibility of the service to the population. Globally CSR ranges from 100 to 11,000 per million population.⁸ In Yemen CSR in 2003 was 1560 and in 2012 was 2473.

Apart from the ophthalmic situation analysis survey in 2003,⁹ there is still lack of information describing eye health care services in Yemen by measurable qualitative parameters. Health care in Yemen is going through a comprehensive process of transformation.¹⁰ The affordability and availability of eye health care services are affected by various changes strongly related to the socio-economic situation of Yemen.

The aim of this study which is done in 2012 was to estimate the CSR after nine years since the 2003 study.⁹ The outcome of this study is going to help decision makers in the Ministry of Health Population and other eye care providers in updating short and long term strategies for the reduction and prevention of blindness in the framework of the global initiative "Vision 2020 – the right to sight".¹⁰

Patients and methods

This retrospective descriptive study was used to determine the number and type of cataract surgeries performed in Yemen in 2012 (01 January to 31 December 2012). Ethical approval from Nebras Health Society was obtained. Initially all cataract units were identified throughout Yemen. A standardized questionnaire (Vision 2020 form B)¹¹ was used by the data collection team to collect information regarding the cataract surgical rate (total number of cataract operations performed within a year per one million inhabitants) in 2012. Those with more than 1,000 cataract surgeries per year were classified as group A, those with 500–1000 were classified as group B and those with less than 500 cataract surgeries were classified as group C.

Data were obtained by information gathered during personal visits by the data collection team to the 184 eye units in governmental, university, military, private and NGOs clinics and hospitals. Information regarding CSR was collected through case records, hospital administration sources and/or theater data.

Results

The response rate to the questionnaire was 80.7%. To increase the accuracy and quality of data, the collected information was obtained from theater lists, case records and hospital administration data. During the 12-month period, a total of 62,577 cataract surgeries were performed by 268 ophthalmology specialists. The majority of cataract surgeries (61.54%) were performed in the private sector facilities. The cataract surgical rate was 2,473 operations per million inhabitants per year. Intraocular lens implantation was performed on 98.02% of the cases. [Table 1](#) shows distribution of ophthalmologists and cataract surgeries by governorates in 2012.

The extracapsular cataract extraction was the leading technique in cataract surgery (81.9%); however, in few centers the phacoemulsification cataract surgery is used (17.9%). Intracapsular cataract extraction was done in (0.2%) of cases.

[Fig. 1](#) shows the total cataract surgeries done by governmental, private eye units and charity eye camps.

[Fig. 2](#) shows CSR map divided into three groups according to number of surgeries in the different governorates.

Majority of cataract surgeries (81%) were performed in the following five governorates: Sana'a city (32%), Hodeidah (21%), Taiz (10.7%), Aden (8.6%) and Hadramout (8.5%) (see [Table 2](#)).

Discussion

The prevalence of blindness and visual impairment in Yemen is among the highest rate in Eastern Mediterranean Region countries.^{12,13} The prevalence of blindness due to cataract increases with age.^{14–16} Cataract related blindness in Yemen is regarded as the most common cause of blindness.^{5,6}

The cataract surgical rate (CSR) is one of the main indicators of eye care services and it indicates the number of cataract operations per million populations. CSR is high in well developed countries ranging between 4000 and 6000 surgeries.^{17,18} The CSR in many developing countries in Africa and Asia is between 500 and 2000.^{18,19} The CSR in Yemen in 2003 was 1560⁹ and increased to 2473 in the current study done in 2012.

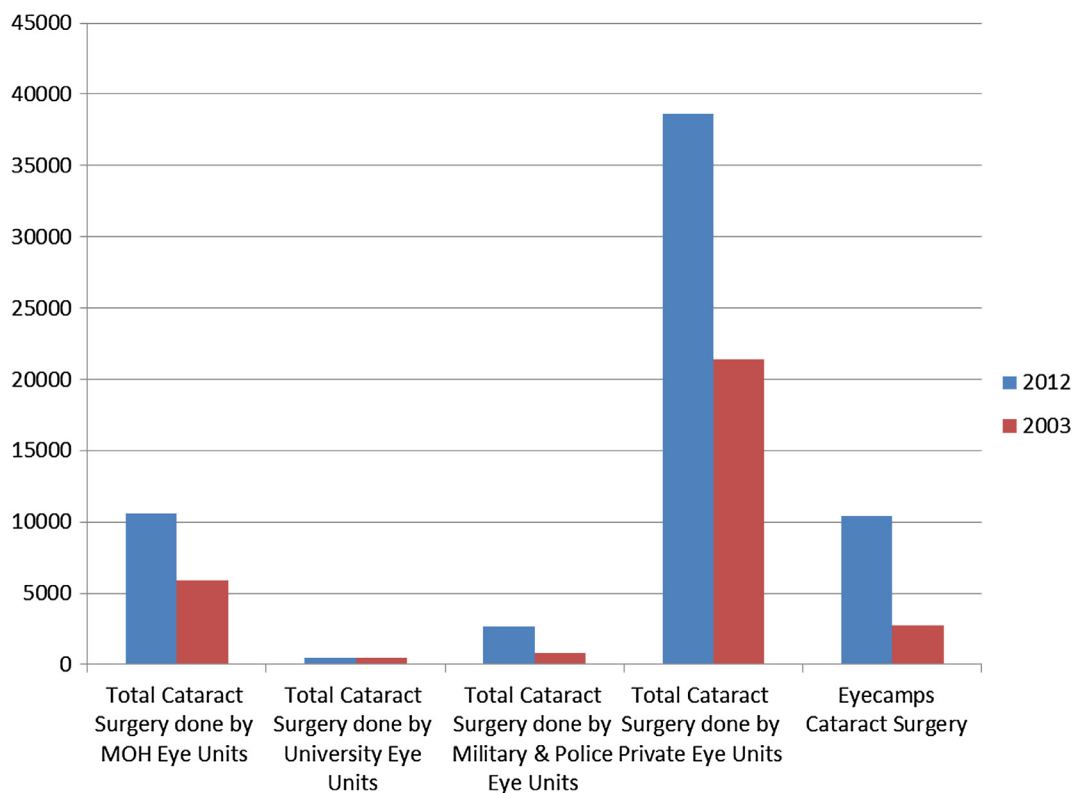
From the study done in 2003⁹ the CSR of 1560 should have increased to 2500 cataract surgeries per million populations by the year 2005 and to 3000 by the year 2010 in order to decrease the backlog of cataract related blindness in Yemen.²⁰ This was not achieved mostly due to deficiency in ophthalmic personnel distribution in many governorates and there was very little increase in establishing eye units in those governorates with lack in eye units.^{21–23} Other causes of not achieving the targeted CSR number estimated in the previous study⁹ are long distances from surgical centers, cost of surgery to the poor Yemeni people and lack of public awareness. In addition to that Yemen in 2011 has gone through major political and socioeconomic difficulties (Arab Spring) which affected the health system including ophthalmic human resources and eye care infrastructure in the whole country.^{24,25}

Cataract surgical rate in Yemen varies between governorates and is shown in [Fig. 2](#). Six governorates (Sana'a City, Aden, Taiz, Hadramout, Hodeidah and Dhala) have CSR of more than 1000. Three governorates (Ibb, Dhamar and Sada) have CSR of 500 to 1000. The remaining thirteen governorates have CSR of less than 500.

Majority of cataract surgeries (81%) were performed in five governorates (Sana'a city (32%), Hodeidah (21%), Taiz (10.7%), Aden (8.6%) and Hadramout (8.5%). Four governorates (Jawf, Mahara, Raymah and Soqatra) had neither eye units nor ophthalmologists. Because of limited governmental resources for health care system the private medical sector is filling the defects in public sector so 61.5% of cataract surgeries are performed in the private sector eye units and 21.8% of cataract surgeries are performed in the public sector eye units: Ministry of Health (16.8%), Military and Police (4.2%) and University (0.8%). 16.6% of cataract surgeries are performed in eye camps which also contribute to increase the awareness of public in rural areas toward cataract related blindness.

Table 1. Distribution of ophthalmologists and cataract surgery by Governorates (2012).

Governorate	Population	Ophthalmologist/100,000 population	Total cataract surgery	Cataract surgical rate (CSR)
Sana'a City	2,648,062	4.50	20,024	7562
Sana'a	1,081,907	0.92	48	44
Aden	794,363	5.67	5376	6768
Taiz	2,929,557	0.96	6690	2284
Hadramout	1,313,225	1.60	5331	4060
Hodeidah	2,795,897	0.47	13,200	4721
Ibb	2,604,358	0.35	1706	655
Dhamar	1,711,037	0.29	1236	722
Al-Beidah	685,306	0.15	170	248
Mahweet	622,306	0.16	0	0
Dhala	621,287	0.64	1123	1808
Lahj	899,187	0.33	152	169
Hajja	1,883,241	0.11	165	88
Sada	922,759	0.11	608	659
Shabwa	567,049	0.35	43	76
Amran	1,180,759	0.17	242	205
Abyan	533,165	0.38	0	0
Mareb	302,613	0	0	0
Jawf	576,546	0	0	0
Mahara	127,380	0	0	0
Raymah	502,027	0	0	0
Soqatra	80,000	0	0	0
Eyecamps	-	-	6463	-
Total	25,382,032	1.06	62,577	2473

**Figure 1.** Total cataract surgery done by governmental, private eye units and eye camps in 2012 and 2003.

Extracapsular cataract surgery is still the main technique for performing cataract surgery in Yemen and accounted for 81.9%. Phacoemulsification surgery has increased over the years where it accounted for 0.8% in 2003⁹ to 17.9% in 2012. This increment in percentage of phacoemulsification surgery is still low compared to neighboring countries where it is the major technique for cataract surgery. The reason for this is the lack of training of ophthalmic personnel in phaco

technique and the low number of eye centers with phacoemulsification surgery services.^{21,27} In 2003 the intraocular lens implantation was 71.6%⁹ and this number has increased to 98.02% in 2012. Intracapsular cataract surgeries were recorded on very rare occasions.

The main limitation of our study is that we couldn't get information of intraoperative and postoperative complications and the final visual outcome of the surgeries performed.

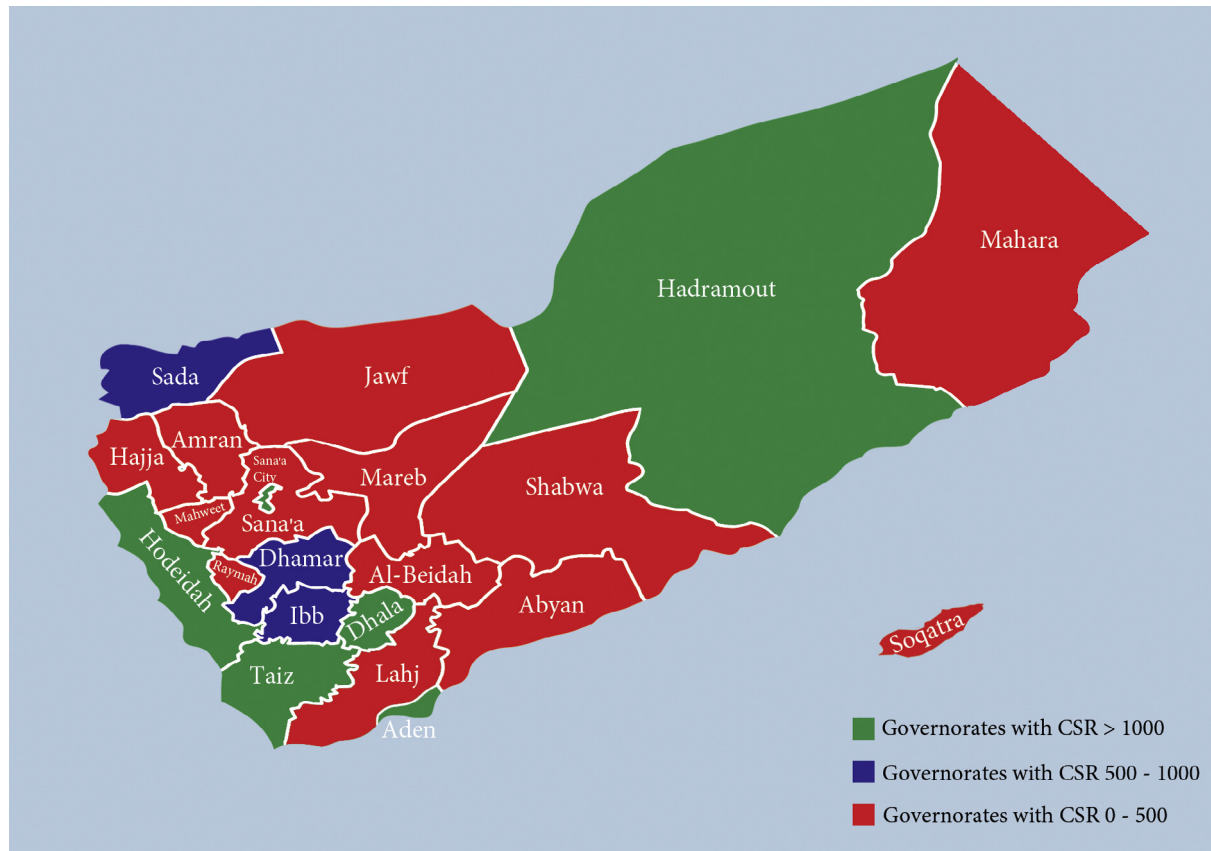


Figure 2. CSR by governorates in Yemen (2012).

Table 2. Characteristics of data in 2003 and 2012.

Item	2003	2012
Population	19.6 Million	25.3 Million
No. of ophthalmologists	203	268
No. of eye units	162	184
No of cataract surgery	28,550	62,577
(1) Public sector	23%	21.8%
(2) Private sector	68%	61.6%
(3) Charity sector	9%	16.6%
Cataract surgical rate (CSR)	1560	2473
% of Intraocular lens (IOL)	71.6%	98.02%
Extracapsular cataract extraction surgery	98.9%	81.9%
Phacoemulsification surgery	0.8%	17.9%

Rapid assessment of cataract surgeries (RACCS) in Yemen was planned to be done in 2008 but it was postponed because of political instability. The CSR can be increased by developing ophthalmic human resources through improving surgical training in cataract surgery mainly in the governorates with the lowest rate of CSR. The current CSR of 2473 is below the line with the WHO recommendations for the Eastern Mediterranean Region countries.²⁰ Although this number is considered good to control the new cases of cataract that occur in the Yemeni population but when we talk about the prevalence of cataract among the population it reaches to 5000 cataract cases per million populations per year.⁹ This means that there is a backlog of cataract cases and performing 2473 cataract surgery per million population only deals partially with the new cases without touching the backlog of cataract cases.

Public awareness of the surgical treatment for cataract should be increased through education in schools and media.^{26,27} Phacoemulsification surgery should be the standard technique in the near future and this can be achieved through workshops and training wet-laboratory sessions for ophthalmic personnel. International Council of Ophthalmology (ICO) has helped in improving cataract surgery techniques in Yemen by sponsoring fellowship grants to Yemeni ophthalmologists for phacoemulsification surgery courses in India. A long term quality analysis of cataract surgery in Yemen is advisable. Inadequate number of eye surgeons, limited accessibility of cataract surgical services in rural areas and the affordability of surgery to large sections of society are major constraints. There is need to increase the cataract surgical rate in Yemen mainly in rural areas.

Conflict of interest

The authors have not disclosed any affiliation or financial involvement with organizations or entities with a direct financial interest in the subject matter or materials discussed in the manuscript. No funding was received for this work from any organization.

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